

Name of the Student: _____

Max. Marks : 09 Marks

Time : 09 Minutes

Q1.

Figure 8 shows a box sliding down a slope in the direction shown.

(3)

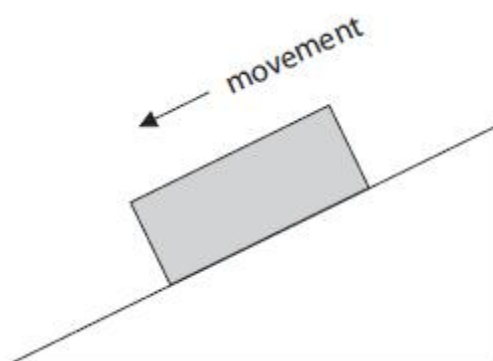


Figure 8

Draw two vector arrows on this diagram showing the 'normal contact force' and 'friction' acting on the box.
Label these two forces.

(Total for question = 3 marks)

Q2.

A student investigates moments of forces.

Figure 14 shows the apparatus used.

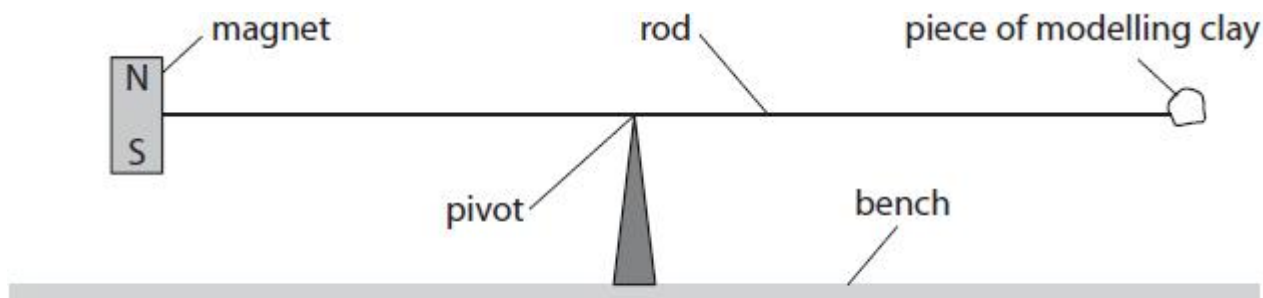


Figure 14

The pivot is under the centre of the rod.

A magnet is fixed to one end of the rod.

A piece of modelling clay is fixed to the other end of the rod.

The system is in equilibrium.

State the relationship between the moment of the weight of the magnet and the moment of the weight of the piece of modelling clay about the pivot.

(1)

.....

.....

(Total for question = 1 mark)

Q3.

Figure 10 shows an arrangement of gears.
Each gear turns around a fixed axle.

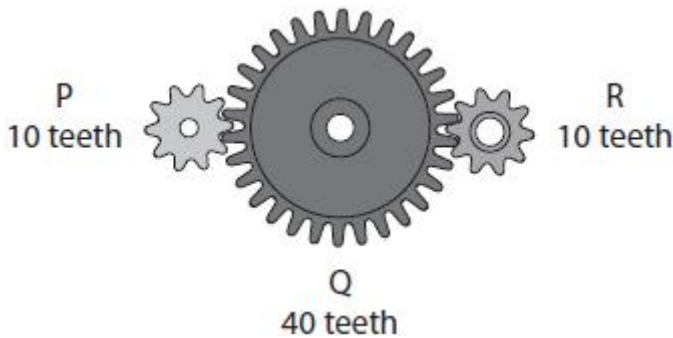


Figure 10

Gear P is turned through one complete revolution per second.

(i) Which of the following describes the motion of gear R?

(1)

	speed (revolutions per second)	direction of rotation
☒ A	4	same as P
☒ B	1	same as P
☒ C	4	opposite to P
☒ D	1	opposite to P

(ii) Figure 11 shows the same arrangement with gear R replaced by a rack.

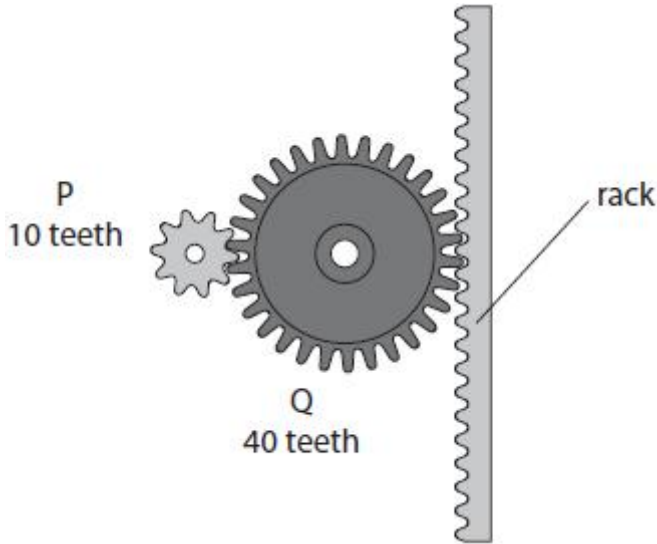


Figure 11

The rack can move up or down when the gears turn.
The teeth on the rack are 2 mm apart.
Calculate how far the rack moves when P turns through to one complete revolution.

(2)

distance = ... mm

(Total for question = 3 marks)

Q4.

Figure 24 shows a submarine underwater.

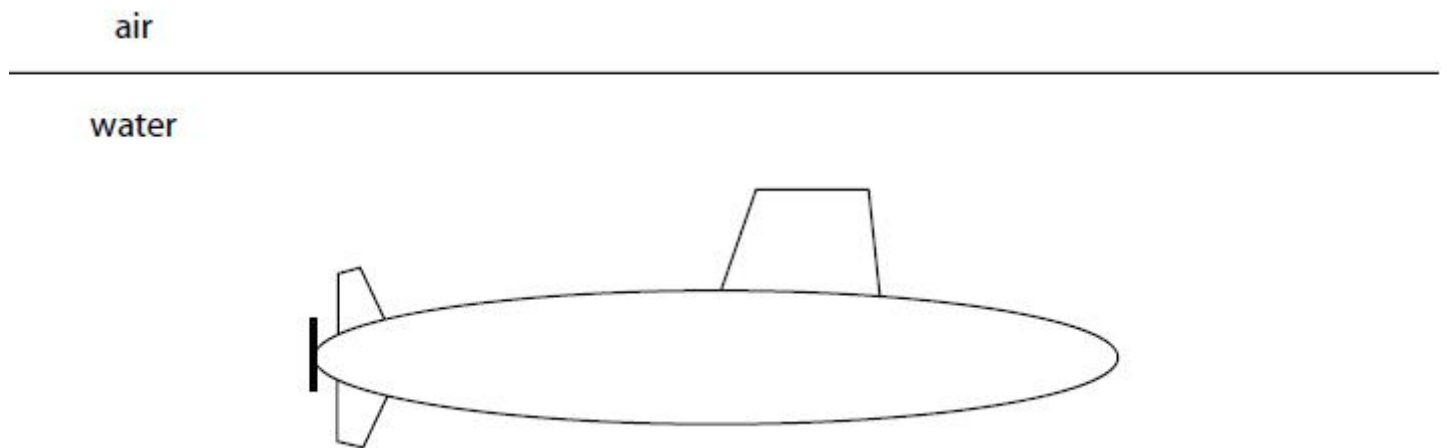


Figure 24

The motor in the submarine turns the gear wheels shown in Figure 25.

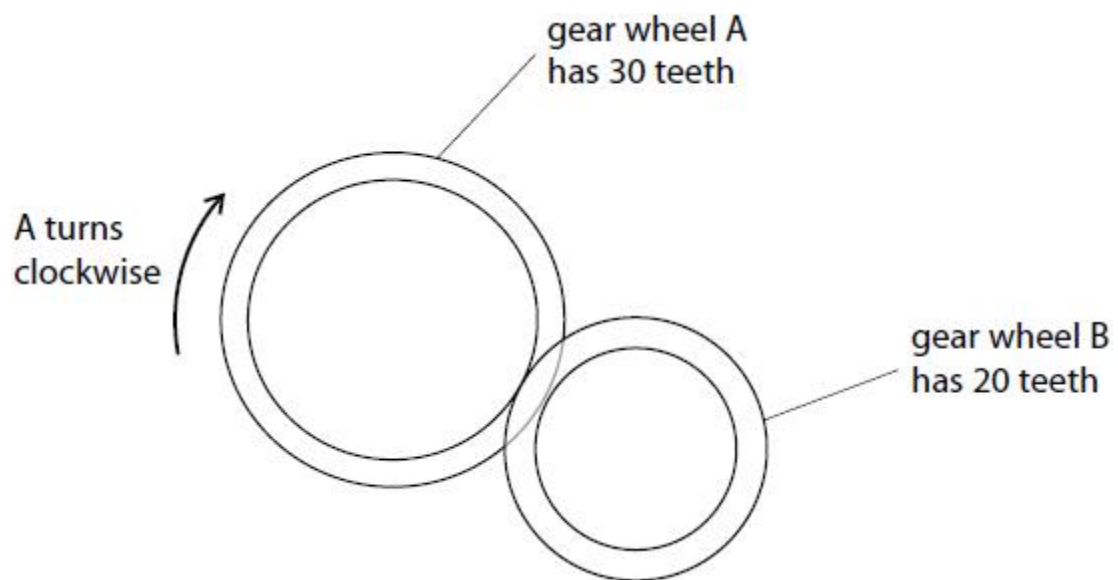


Figure 25

Gear wheel A rotates clockwise through one complete turn.

Which of these is correct for gear wheel B?

(1)

	amount that gear wheel B rotates	direction gear wheel B rotates
☐ A	1½ turns	clockwise
☐ B	1½ turns	anticlockwise
☐ C	$\frac{2}{3}$ of a turn	clockwise
☐ D	$\frac{2}{3}$ of a turn	anticlockwise

(Total for question = 1 mark)

Q5.

Some questions must be answered with a cross in a box (☒). If you change your mind about an answer, put a line through the box (☒) and then mark your new answer with a cross (☒).

Which of these is a vector quantity?

(1)

- ☐ A acceleration
- ☐ B speed
- ☐ C time
- ☐ D distance

(Total for question = 1 mark)